

1. An electric field alignment method of liquid crystal display, comprising the steps of:

applying a first voltage to a gate terminal of a thin film transistor for driving a liquid crystal cell having ferroelectric liquid crystal, wherein the first voltage is below a threshold voltage of the thin film transistor; and

supplying a second voltage for electric field alignment of the ferroelectric liquid crystal to the liquid crystal cell by using leakage current of the thin film transistor generated due to the first voltage.

2. The method according to claim 1, wherein the liquid crystal cell is a Half V-Switching mode ferroelectric liquid crystal cell.

3. The method according to claim 1, wherein the first voltage is between about -5 volts to about 20 volts.

4. The method according to claim 1, wherein the first voltage is between about 0 volt to 1 volt.

5. The method according to claim 1, wherein the first voltage is floating.

6. The method according to claim 1, wherein the second voltage has uniformly

maintained polarity and is applied to a source terminal of the thin film transistor such that the second voltage is supplied from the source terminal to a pixel electrode of the liquid crystal cell via leakage current of the thin film transistor to a drain terminal of the thin film transistor that is connected to the pixel electrode.

7. An electric field alignment method of ferroelectric liquid crystal display having ferroelectric liquid crystal cells in which a thin film transistor is formed at crossings of data lines and gate lines, comprising the steps of:

supplying a first voltage below a threshold voltage of the thin film transistor to the gate lines;

supplying a second voltage to the data lines for electric field alignment of the ferroelectric liquid crystal by using leakage current flowing in the thin film transistor.

8. The method according to claim 7, further comprising the step of:

supplying video data to the data lines during normal driving of the liquid crystal display.

9. The method according to claim 7, further comprising the step of:

supplying scan voltage set to more than the threshold voltage of the thin film transistor to the gate lines during normal driving of the liquid crystal display.

10. The method according to claim 7, wherein the liquid crystal cell is a Half V-Switching mode ferroelectric liquid crystal cell.

11. The method of according to claim 7, wherein the first voltage is between about -5 volts to about 20 volts.

12. The method according to claim 7, wherein the first voltage is 0 volt to about 1 volt.

13. The method according to claim 7, wherein the first voltage is floating.

14. The method according to claim 7, wherein the voltage of mutually contrary polarity is applied to the data lines.

15. The method according to claim 14, wherein the polarity of voltage supplied to each of the data lines is uniformly maintained during electric field alignment of the ferroelectric liquid crystal cells.

16. A liquid crystal display, comprising:
a plurality of ferroelectric liquid crystal cells;
a plurality of thin film transistors for driving each of the plurality of ferroelectric liquid crystal cells; and
an electric field alignment circuit for applying a first voltage below a threshold voltage of the thin film transistor to a gate terminal of the thin film transistor and for aligning the plurality

of ferroelectric liquid crystal cells under an electric field by using leakage current of the thin film transistor.

17. The liquid crystal display according to claim 16, wherein the plurality of liquid crystal cells are Half V-switching mode ferroelectric liquid crystal cells.

18. The liquid crystal display according to claim 16, wherein the first voltage is between about -5 volts to about 20 volts.

19. The liquid crystal display according to claim 16, wherein the first voltage is between 0 volt and 1 volt.

20. The liquid crystal display according to claim 16, wherein the first voltage is floating.

21. The liquid crystal display according to claim 16, wherein a second voltage having uniformly maintained polarity is applied to a source terminal of the thin film transistor such that the second voltage is supplied from the source terminal to a pixel electrode of the liquid crystal cell via leakage current of the thin film transistor to a drain terminal of the thin film transistor that is connected to the pixel electrode.

22. A ferroelectric liquid crystal display, comprising:

a liquid crystal panel having ferroelectric liquid crystal cells;
data lines and gate lines;
thin film transistors for supplying voltage on the data lines to the liquid crystal cells in response to a scan voltage on the gate line;
a gate driver for supplying a first a voltage below threshold voltage of the thin film transistor to the gate lines; and
a data driver for supplying a second voltage for electric field alignment to the data lines during electric field alignment of the liquid crystal cell.

23. The ferroelectric liquid crystal display according to claim 22, wherein the data driver supplies video data to the data lines by column inversion method during normal driving of the liquid crystal display.

24. The ferroelectric liquid crystal display according to claim 22, wherein the gate driver supplies scan voltages above the threshold voltage of the thin film transistors to the gate lines during normal driving of the liquid crystal display.

25. The ferroelectric liquid crystal display according to claim 22, wherein the liquid crystal cell is a Half V-Switching mode ferroelectric liquid crystal cell.

26. The ferroelectric liquid crystal display according to claim 22, wherein the first voltage is between about -5 volts to about 20 volts.

27. The ferroelectric liquid crystal display according to claim 22, wherein the first voltage is between 0 volt and 1 volt.

28. The ferroelectric liquid crystal display according to claim 22, wherein the data driver supplies a second voltage for electric field alignment to the data lines by column inversion method during electric field alignment of the ferroelectric liquid crystal.

29. The ferroelectric liquid crystal display according to claim 28, wherein the polarity of voltage supplied to each of the data lines is uniformly maintained during electric field alignment of the ferroelectric liquid crystal.

30. The ferroelectric liquid crystal display according to claim 22, wherein the first voltage is floating.